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International Journal of Social Economics

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Article information:

To cite this document:
Muzafar Shah Habibullah Badariah H.Din Baharom Abdul Hamid , (2016),"Good governance and crime rates in Malaysia", International Journal of Social Economics, Vol. 43 Iss 3 pp. 308 - 320
Permanent link to this document:
http://dx.doi.org/10.1108/IJSE-05-2014-0096

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Received 19 May 2014
Revised 23 October 2014
17 December 2014
Accepted 21 December 2014

Good governance and crime rates in Malaysia

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Abstract

Purpose – The purpose of this paper is to relate the quality of governance with crime in Malaysia. The study also identifies the best good governance tool to fight against crime in Malaysia.
Design/methodology/approach – The study uses time-series data on crime rates and six measures of governance: voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. In this study the authors employed the popular autoregressive distributed lagged modeling approach to estimate the long-run model of crime and governance.
Findings – The authors test the hypothesis that good governance lowers crime rates (total crime, violent and property crimes). The results suggest a negative relationship between crime rates and good governance in Malaysia. This suggests that good governance reduces crime rates in Malaysia.
Research limitations/implications – The limitations of this study is the short time-series used in the analysis which is from 1996 to 2009.
Practical implications – This study provides evidence that the practice of good governance, for example, lower corruption, good policing and judicial system can mitigate crime in Malaysia.
Social implications – The implementation of good governance will protect property right of individuals, business sector and the society as a whole, and this will enhance prosperity of a nation.
Originality/value – This study provide the first empirical evidence that linking between crime and good governance in Malaysia.

Keywords Malaysia, Good governance, Crime, ARDL, Small sample
Paper type Research paper

Introduction

The purpose of this study is to investigate whether or not a long-run relationship exists between good governance and crime rates in Malaysia. In the economic literature, numerous studies suggest a positive relationship between poor government, and crime rates. Poor government is generally defined in terms of government corruption and poor enforcement laws for property rights. These studies also suggest that poor government leads to a reduction in economic growth (Jalilian *et al.*, 2006; Pellegrini and Gerlagh, 2004; Mauro, 1995; Aidt *et al.*, 2008; Abe and Wilson, 2008; Blackburn and Forgues-Puccio, 2009).

We add to the debate by investigating the long-run relationship between good governance and crime rates in Malaysia. The World Bank (1994) defines governance as the ability and capacity of a government to exercise its power to design, formulate and implement policies, and with clear functions to manage a country's resources for economic and social development.

International Journal of Social Economics
Vol. 43 No. 3, 2016
pp. 308-320

0306-8293
DOI 10.1108/IJSE-05-2014-0096

Good governance of a country has also been defined in terms of accountability, efficiency and effectiveness in public sector management, in terms of free flow of information (i.e. transparency), and in terms of a clear legal framework for ensuring social and economic development (i.e. justice, respect for human rights and liberties) (United Nations Economic and Social Council, 2006).

The outcomes of poor quality governance are found to be related to increased uncertainty, unpredictability and instability of a country's political, economic and social systems (North, 1990). Poor quality governance discourages domestic and foreign investments, for example. It increases indirectly, the cost of trade (i.e. transaction costs), thereby negatively affecting economic growth.

Sustained long-term economic growth, which would be the ultimate goal of any government of any nation, cannot be achieved without a stable economic and political system. To this end the protection of "property rights" is a crucial element (Mabry and Ulbrich, 1989).

Property rights are defined in terms of the ownership of goods and services. They provide a legal framework for the transfer and use of these goods and services. Without property rights legislation criminal activities are encouraged, while the cost of "doing legal and honest businesses," for example, would escalate (Gradstein, 2003). Studies on this topic suggest that without this type of government intervention the market would not work effectively (Witte and Witt, 2001).

In this paper we investigate how effective the government can be in preventing crime in Malaysia, where criminal activities are high. We postulate that crime prevention, in terms of protecting property rights, and reduction in criminal activity, are a signal of good governance.

We define crime in terms of crime rates. Crime rates are measured as the number of reported crime per 100,000 people living in Malaysia. We distinguish crime between property and violent crimes and provide the crime rates for those. Moreover, we consider the period 1996-2009, as in Malaysia the data on crime are available only for this time period. The 13 years period provides the basis for investigating the long-run relationship between good governance and crime rates in Malaysia.

To provide a measure for this long-run relationship, we employ the autoregressive distributed lag (ARDL) model suggested by Pesaran *et al.* (2001). The long-run relationship can be inferred by the additional application of the method suggested by Ericsson and MacKinnon (2002), Narayan (2005) and Turner (2006).

The paper is organized as follows. In second section, we review the empirical literature related to crime and good governance. The method, data and model used in the study are discussed in third section. In fourth section, we present and discuss the empirical results. The last section is our conclusion.

Literature review

Recent studies have been investigating the role of governance in affecting economic growth. The consensus is that if a positive relationship between economic growth and good governance exists, there is a negative relationship between good governance and crime (Neumayer, 2003; Andres and Asongu, 2013; Asongu and Oasis, 2013).

Asongu and Oasis (2013), for example, suggest a number of measures for good governance and investigate what best mitigate the negative impact of crime on economic growth across 38 African countries. For governance measures they include a quality indicator of good laws and regulation, government effectiveness, political stability, voice and accountability, corruption control and democracy.

The cross-sectional data included control variables such as the number of policemen employed, the number of working-age individuals, per capita gross domestic product (GDP), and education and population density. The results suggest that quality of laws and regulation, government effectiveness, political stability, voice and accountability, corruption control and democracy, have significant impact on crime (and conflicts) reduction. The results suggest that these aspects of good governance mitigate the negative impact of crime on economic growth. Therefore, crime rates decrease with increase in good governance.

Andres and Asongu (2013) provide another recent example of how good governance can reduce crime. They investigate the government effort in combating software piracy in 11 African countries. They provided similar governance measures as in the Asongu and Oasis (2013) study, but with an additional variable: "press freedom quality."

Using data from 2000 to 2010, with control variables such as population growth, real GDP growth, gross domestic savings, foreign direct investments and government investments, the findings confirmed that, except for press freedom quality, all other governance indicators significantly decrease the incidence of software piracy.

In an earlier study, Neumayer (2003) investigated whether good political governance and good economic policies reduce homicide rates in 117 countries. Measures of good political governance included democracy, respect for human rights and the absence of death penalty. Indicators for good economic policies comprised welfare expenditures, economic discrimination of minorities and income inequality. The findings suggested that the abolition of the death penalty, human rights and democracy lower homicide rates.

For the purpose of this study, we use six measures of governance as indicators of quality governance (i.e. good or poor), as suggested by the World Bank (in Kaufman *et al.*, 2008). Some of these are common to the above mentioned studies. The indicators are defined in the next section along with the method and model used in this study.

Data, methodology and model

For the purpose of this study, data on crime rates are extracted from the Yearbook of Statistics published by the Department of Statistics Malaysia, for the years 1996-2009.

The data

All crime rates are measured as the number of reported crime per 100,000 people. We distinguish crime between total crime (tc_t), violent crime (vc_t) and property crime (pc_t).

As mentioned we employ six measures of governance. These are indicators of its quality (as suggested by the World Bank – in Kaufman *et al.*, 2008).

The measures are the following:

(1) voice and accountability: measures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media;

(2) political stability and absence of violence: measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism;

(3) government effectiveness: measures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policies;

(4) regulatory quality: measures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development;

(5) rule of law: measures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence; and

(6) control of corruption: measures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Table I provide full details of the sources and description of the variables used in this study. All variables were transformed into natural logarithm before estimation.

The method and model

The investigation will proceeds as per the following. The specification of the model is given first. However, before running the regression, a test for cointegration will be performed to determine whether or not a long-run relationship between crime and governance exists, and whether or not governance affects crime in the long-run.

Depending on the outcome of the test, and in the event of a cointegration (i.e. governance affects crime in the long-run), an ARDL equation will be proposed and estimated, to account for "spurious" regression results, which would otherwise lead to "weak" results. To account for "spurious" regression results, we propose the autoregressive distributed lag-restricted error-correction model (ARDL-RECM). The results are presented and discussed in the following section.

The specification of the model for the long-run crime-governance in Malaysia is the following:

$$crime_t = \theta_0 + \theta_1 govern_t + \mu_t \quad (1)$$

where small letters indicate variables in natural logarithm and μ_t is the error term. The parameters θ*'s* are to be estimated. It is a priori that we expect $\theta_1 < 0$, suggesting a negative relationship between good governance and criminal activity, that is, increase in government quality (good governance) will lead to reduction in crime rates.

However, estimating (1) using OLS is not a straight forward exercise because, as mentioned, the estimated equation is subject to the so-called spurious regression results

No.	Variables	Sources
1	Total crime rate	Department of Statistics, Malaysia (2012)
2	Violent crime rate	Department of Statistics, Malaysia (2012)
3	Property crime rate	Department of Statistics, Malaysia (2012)
4	Voice and accountability	World Bank (2012)
5	Political stability	World Bank (2012)
6	Government effectiveness	World Bank (2012)
7	Regulatory quality	World Bank (2012)
8	Rule of law	World Bank (2012)
9	Control of corruption	World Bank (2012)

Table I. Sources of data and variable descriptions

(Granger and Newbold, 1974). Spurious regression results arise from estimating an equation containing non-stationary economic variables. The results would lose validity.

However, recent research in time-series analysis found new procedures for better estimating long-run and short-run relationships between non-stationary variables. The following subsection explains the procedure adopted in this paper.

Testing for cointegration (long-run relationship)

One widely used procedure to account for spurious regression results was suggested by Granger (1981, 1986). In a dynamic model specification, he employed an error-correction mechanism (ECM) in single-equation and multi-equation macroeconomic forecasting models, to test for cointegration. In our model, to do so, we employ the bounds test proposed by Pesaran *et al.* (2001), which seems to be more appropriate, given the time period considered. Furthermore, this approach does not impose the unit root test requirement for the time-series variables.

We also argue that even though we investigate relationships for the time period 1996-2009, the estimators of the parameters can be consistent and can be tested for cointegration. For example, Pesaran and Shin (1999) show that within the ARDL framework, the OLS estimators of the short-run parameters are $\sqrt{T}$-consistent, and the ARDL-based estimators of the long-run coefficients are consistent, even in small sample sizes. Moreover, Narayan (2005), for example, provided critical values for samples as small as 30-80 observations, while Turner (2006), was able to generate response surfaces for the *F*-test for cointegration, even in small samples.

To test for cointegration, or for the existence of a long-run relationship between crime and governance, we propose to use the bounds test, as mentioned above.

First, we estimate the following ARDL unrestricted error-correction model (UECM), for the crime-governance equation, $crime_t$, which is conditional to a type of governance:

$$\Delta crime_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1i} \Delta crime_{t-i} + \sum_{i=0}^{q} \alpha_{2i} \Delta govern_{t-i} + \beta_1 crime_{t-1} + \beta_2 govern_{t-1} + v_{1t} \quad (2)$$

where Δ is the difference operator, p and q are optimal lag length chosen; α_0 is a constant term and v_{1t} is the disturbance term in the crime equation. Then, we employ the method suggested by Pesaran *et al.* (2001), to bound the test for cointegration, or for the existence of a long-run relationship between crime and governance.

An *F*-test, which can be denoted as $F_{crime}(crime|govern)$ or $F_{crime}(.)$, for the joint significance of the coefficients of the lag levels in (2) is proposed. The null hypothesis for non-cointegration among variables in the equation, is the following: $H_0: \beta_1 = \beta_2 = 0$, against the alternative $H_a: \beta_1 \neq \beta_2 \neq 0$. Rejection of the null hypothesis suggests cointegration between crime and governance, or that governance affects crime in the long-run.

The asymptotic distribution of critical values is obtained for cases in which all regressors are purely $I(1)$ as well as when the regressors are purely $I(0)$ or mutually cointegrated. It is calculated using the response surfaces as provided by Ericsson and MacKinnon (2002), and as per Equation (4).

Because the critical value of the test depends on the order of integration of the variables, $I(d)$, where $0 \leqslant d \leqslant 1$, the test utilizes a critical range such that values

exceeding the range are evidence of rejection, while values less than the range are evidence of non-rejection, and finally, values within the range are inconclusive.

In other words, if the *F*-statistics exceed their respective upper critical values we can conclude that a long-run relationship exists, without a need to know the order of integration of the regressors. If the *F*-statistics fall below the lower critical values, we cannot reject the null hypothesis of no cointegration, and estimation can continue assuming no long-run relationship. If the *F*-statistics falls between the two bounds, the result is inconclusive.

In the event that $crime_t$ and $govern_t$ are cointegrated after estimating (2), and hence, in the event that governance affects crime in the long-run, the following ARDL equation will be estimated and modified to account for "spurious" effects, as the ARDL-RECM:

$$crime_t = \gamma_0 + \sum_{i=1}^{p} \gamma_{1i} crime_{t-i} + \sum_{i=0}^{q} \gamma_{2i} govern_{t-i} + \eta_t \quad (3)$$

All the variables are defined in Table I. The optimal lag length in (3) is selected using Schwartz Bayesian Criterion (SBC) as suggested by Pesaran *et al.* (1996). In the presence of cointegration, the following ARDL-RECM equation can be specified as:

$$\Delta crime_t = \delta_0 + \sum_{i=1}^{p} \delta_{1i} \Delta crime_{t-i} + \sum_{i=0}^{q} \delta_{2i} \Delta govern_{t-i} + \lambda ECM_{t-1} + \omega_t \quad (4)$$

where ECM_t is the error-correction term define as:

$$ECM_t = crime_t - \left[\gamma_0 + \sum_{i=1}^{p} \gamma_{1i} crime_{t-i} + \sum_{i=0}^{q} \gamma_{2i} govern_{t-i} \right] \quad (5)$$

From (4), the significance of the parameter λ is indicative of cointegration. The asymptotic critical values for the cointegration test, using the *t*-statistics on β_1 and λ, is calculated using the method by Ericsson and MacKinnon (2002), as mentioned above.

After the test, the long-run coefficients can be obtained from the estimates of (3) ARDL-RECM, as follows:

$$crime_t = \theta_0 + \theta_1 govern_t + \mu_t \quad (6)$$

where $\theta_0 = \gamma_0 / 1 - \sum_{i=1}^{p} \gamma_{1i}$, $\theta_1 = \sum_{i=0}^{q} \gamma_{2i} / 1 - \sum_{i=1}^{p} \gamma_{1i}$, and where μ_t white noise. The next section presents the results.

Empirical results

In this section, we present the results. Table II describes an interesting relationship between crime rates and governance in Malaysia for 1996 and 2009. There are three types of crime and six governance indicators (for its quality).

As mentioned, the three types of crime are total crime, violent crime and property crime; whereas the indicators for the quality of governance are voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

The data presented in Table II clearly suggest that the crime rates in Malaysia have been increasing between 1996 and 2009. During this time period total

Table II.
Descriptive statistics for crime rates and governance indices

	Total crime	Violent crime	Property crime	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
1996	87,902	12,340	75,562	−0.06	0.47	0.75	0.69	0.61	0.51
2009	221,213	42,015	179,198	−0.50	−0.04	0.96	0.33	0.48	−0.04
Mean	165,656	24,721	140,934	−0.37	0.21	1.02	0.53	0.48	0.32
Maximum	221,213	42,015	179,198	−0.06	0.54	1.24	0.69	0.61	0.55
Minimum	87,902	12,340	75,562	−0.56	−0.13	0.75	0.33	0.31	−0.04
SD	35,931	8,497	28,106	0.15	0.21	0.16	0.09	0.09	0.17
Skewness	−0.31	0.79	−0.67	0.49	0.03	−0.43	−0.75	−0.33	−0.62
Kurtosis	2.94	2.56	3.32	2.10	1.79	1.91	3.41	1.83	2.59
Jarque-Bera	0.23	1.57	1.12	1.04	0.84	1.12	1.44	1.04	0.99
p-value	0.89	0.45	0.57	0.59	0.65	0.57	0.48	0.59	0.60
% change between 1996 and 2009	151.62	240.52	137.20	−733.32	−108.50	28.00	−52.22	−21.28	−107.80
Yr % change 1996-2009	10.83	17.18	9.80	−52.38	−7.75	2.00	−3.73	−1.52	−7.70

Note: Authors' calculation

crime reached 151.61 percent, violent crime reached 240.52 percent and property crime reached 137.20 percent (see row 11, for example).

These trends indicate that for the 14 years period (see row 12, for example), and on average, total crime has been increasing by 10.83 percent per year, while violent crime and property crime have been increasing by 17.18 and 9.80 percent per year, respectively. Interestingly, the 14 years period also suggest a worsening of the indicators for good governance.

Only one good governance indicator (i.e. government effectiveness) has been improving during the time period, from 0.75 in 1996 to 0.96 in 2009. However, the other five indicators, such as voice and accountability, political stability, regulatory quality, rule of law and control of corruption, have been worsening, suggesting "bad" governance. These results indicate that crime rates in Malaysia increase with bad governance.

A scatter plot shows relationships of interest. For example, Figure 1 shows the relationship between total crime and the six governance indicators. Figure 2 shows the relationship between violent crime and the six governance indicators. Figure 3 shows therelationship between property crime and the six governance indicators.

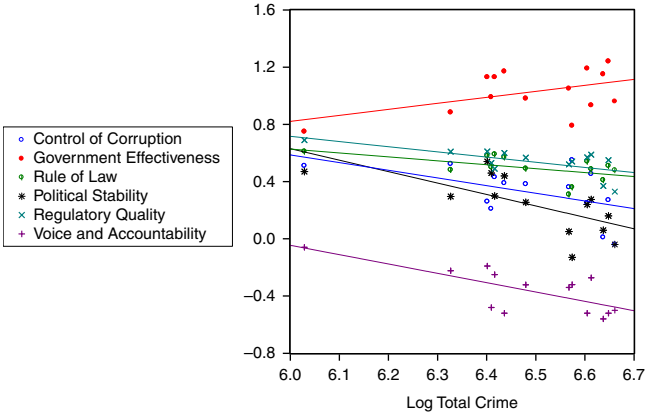

Figure 1.
Relation of log total crime and governance indices

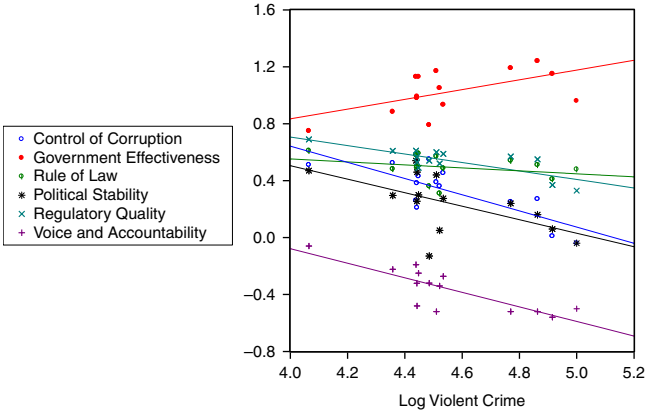

Figure 2.
Relation of log violent crime and governance indices

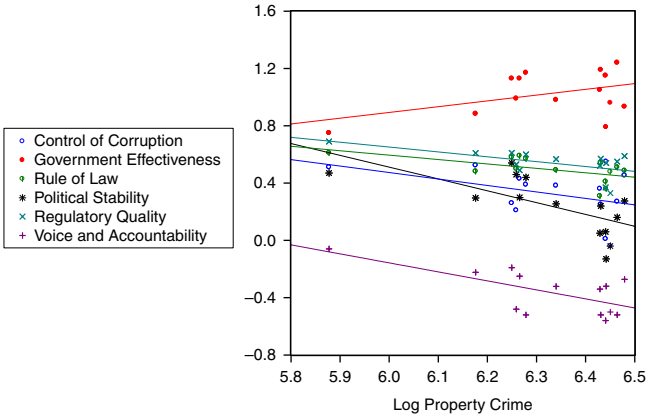

Figure 3.
Relation of log property crime and governance indices

In all the three cases, we can clearly observe the negative correlation between crime rates and governance indicators (except for government effectiveness). Moving from left to right (which means that we move from "bad" to "good" governance) on the governance indicators' scale, crime rates are lower. Thus, it seems clear that the better the quality of governance, the lower the crime rates are.

However, the above scatter plots cannot indicate which of the six governance indicators is most effective in decreasing crime in Malaysia. Moreover, we would not be able to infer whether or not the relationships are significant, statistically. Let us consider Table III.

In Table III (as well as in Tables IV and V) we only report the respective ARDL(p, q) model (i.e. Equation (3)) for each of the governance indicators. For the long-run model we only report the long-run coefficient, θ_1 (Equations (1) or (6)) in row 13; for the ARDL-RECM (Equation (4)) we report the coefficient of λ; and for the ARDL-UECM (Equation (2)) we report both the coefficients of β_1 in row 14, and the F-statistics for H_0: $\beta_1 = \beta_2 = 0$ in row 15. The final ARDL(p, q) models presented in Table III were chosen based on the SBC and the non-serial correlation of the error terms.

In this study, we found that there is cointegration between the crime rate and governance. We also found that when there is cointegration, the long-run equation is non-spurious and therefore, the inference that a long-run relationship between crime and governance exists, is valid.

The results from Table III suggest that the following: first, there is cointegration between total crime rate and voice and accountability, political stability and control of corruption.

Second, for model with voice and accountability, λ is statistically significant at the 10 percent level. Third, for political stability, λ is statistically significant at the 10 percent level; β_1 is statistically significant at the 5 percent level, while the F-statistic for the bounds test is statistically significant at the 5 percent level. Fourth, for the model with control of corruption, λ is statistically significant at the 10 percent level. Therefore, the practice of good governance reduces total crime rates in Malaysia, and interestingly, it seems that the control of corruption is the best government tool to mitigate total crime rates.

We also attempt to answer another question: which of the following crimes respond more to changes in good governance? We focus on violent and property crimes.

Variables	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
ARDL(p, q)	ARDL(2, 0)	ARDL(1, 0)	ARDL(2, 0)	ARDL(2, 0)	ARDL(1, 2)	ARDL(2, 1)
Constant	3.902 (3.727)**	4.335 (3.623)**	3.193 (2.334)**	4.556 (2.844)**	2.956 (1.965)	4.972 (3.755)**
tc_{t-1}	0.894 (4.316)**	0.348 (1.906)	0.948 (3.354)**	0.789 (2.845)**	0.531 (2.498)**	0.892 (4.042)**
tc_{t-2}	−0.511 (3.708)**		−0.451 (2.295)	−0.449 (2.721)**		−0.635 (4.038)**
$govern_t$	−0.220 (2.582)**	−0.369 (3.201)**	0.124 (0.318)	−0.559 (1.318)	−0.724 (2.001)	−0.183 (0.846)
$govern_{t-1}$					0.020 (0.053)	−0.325 (1.420)
$govern_{t-2}$					0.980 (2.836)**	
R^2	0.772	0.669	0.587	0.656	0.723	0.794
SER	0.056	0.064	0.076	0.069	0.066	0.057
SBC	14.85	13.86	11.28	12.39	12.44	14.21
AR(1) p-value	0.983	0.304	0.796	0.949	0.304	0.239
Long-run coefficient: θ_1	−0.357 (2.500)**	−0.567 (2.759)**	0.246 (0.321)	−0.843 (1.575)	0.591 (0.447)	−0.685 (2.962)**
H_0: $\lambda = 0$, t-statistic	−0.617 (3.791)***	−0.651 (3.560)***	−0.503 (2.382)	−0.663 (2.884)	−0.468 (2.201)	−0.743 (3.713)***
H_0: $\beta_1 = 0$, t-statistic	−0.542 (3.011)	−0.638 (4.552)**	−0.533 (2.410)	−0.663 (2.632)	−0.468 (2.201)	−0.743 (3.713)
H_0: $\beta_1 = \beta_2 = 0$, F-statistic	4.537	10.57**	2.913	3.676	4.107	7.389***

Notes: SBC, Schwarz Bayesian Criterion; SER, standard error of regression; AR(1), non-serial correlation of the first-order. For the t-test for cointegration: for $K_c(3)$, the critical values are −5.162 (1 percent), −3.902 (5 percent) and −3.356 (10 percent). For $K_c(4)$, the critical values are −5.633 (1 percent), −4.172 (5 percent) and −3.569 (10 percent). For $K_c(5)$, the critical values are −6.170 (1 percent), −4.479 (5 percent) and −3.779 (10 percent). For ARDL-RECM, the appropriate ARDL(p, q) for $K_c(3)$ are ARDL(1, 0), and ARDL(1, 1); for $K_c(4)$ are ARDL(2, 0), ARDL(1, 2) and ARDL(2, 1). For ARDL-UECM, the appropriate ARDL(p, q) for $K_c(4)$ are ARDL(1, 0), and ARDL (1, 1); for $K_c(5)$ are ARDL(2, 0), ARDL(1, 2), and ARDL(2, 1). The t-values are calculated from the response surface given by Ericsson and MacKinnon (2002). For the F-test for cointegration: for $I(1)$ with $k = 2$, the critical values are 13.410 (1 percent), 7.924 (5 percent) and 5.940 (10 percent); for $I(0)$ with $k = 2$, the critical values are 11.422 (1 percent), 6.561 (5 percent) and 4.898 (10 percent). The F-values are calculated from the response surface given by Turner (2006). **,***Statistically significant at the 5 and 10 percent levels, respectively

Table III.
Results of the impact of good governance on total crime

This question would be in line with Cherry and List (2002, p. 81) who argue that "it is inappropriate to pool crime types into a single decision model and that", "much of the existing empirical evidence suffers from aggregation bias." We postulate that criminals involved in these two different activities have different motives. They respond differently to laws and regulations. We propose that, by identifying which of the governance indicators criminals respond the most, we can also identify which is the most appropriate governance tool that best mitigate these two types of crime in Malaysia.

Table IV presents the results of the impact of good governance on violent crime. The results suggest that good governance has no apparent impact on violent crimes. The three tests for cointegration are not statistically significant at 1 or 5 or 10 percent level, for all six governance indicators.

On the contrary, results in Table V suggest that all governance indicators, except government effectiveness, can affectively decrease property crimes. The next section is our conclusion.

Conclusion

In this study we investigated whether or not a long-run relationship exists between good governance and crime rates in Malaysia. We considered three categories of crime rates – total crime, violent and property crimes; and six measures of good governance (i.e. indicators), for the period 1996-2009. The six governance indicators are voice and

Variables	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
ARDL(p, q)	ARDL(1, 1)	ARDL(1, 0)	ARDL(1, 0)	ARDL(1, 0)	ARDL(1, 0)	ARDL(2, 1)
Constant	−0.088 (0.089)	0.496 (0.520)	0.035 (0.039)	0.112 (0.117)	0.086 (0.045)	5.129 (2.968)**
vc_{t-1}	1.018 (4.303)**	0.910 (4.437)**	0.963 (4.811)**	0.986 (4.993)**	0.991 (2.936)**	0.804 (3.270)**
vc_{t-2}						−0.840 (2.779)**
$govern_t$	−0.374 (2.605)**	−0.195 (0.908)	0.256 (0.454)	0.005 (0.009)	0.017 (0.017)	−1.014 (2.210)
$govern_{t-1}$	0.282 (1.532)					−0.548 (1.634)
R^2	0.873	0.759	0.743	0.737	0.737	0.897
SER	0.087	0.113	0.117	0.118	0.118	0.084
SBC	9.67	7.04	6.65	6.52	6.52	9.653
AR(1) p-value	0.140	0.467	0.701	0.615	0.562	0.523
Long-run coefficient: θ_1	5.121 (0.066)	−2.191 (0.474)	7.015 (0.186)	0.429 (0.009)	1.998 (0.010)	−1.508 (6.548)**
H_0: $\lambda = 0$, t-statistic	0.018 (0.076)	−0.089 (0.434)	−0.036 (0.182)	−0.013 (0.067)	−0.008 (0.026)	−1.036 (2.901)
H_0:$\beta_1 = 0$, t-statistic	−0.178 (0.719)	−0.180 (1.003)	−0.175 (0.674)	−0.128 (0.778)	−0.201 (0.656)	−1.036 (2.901)
H_0:$\beta_1 = \beta_2 = 0$, F-statistic	0.294	0.745	0.320	0.758	0.923	4.968

Notes: SBC, Schwarz Bayesian Criterion; SER, standard error of regression; AR(1), non-serial correlation of the first-order. For the t-test for cointegration: for $K_c(3)$, the critical values are −5.162 (1 percent), −3.902 (5 percent) and −3.356 (10 percent). For $K_c(4)$, the critical values are −5.633 (1 percent), −4.172 (5 percent) and −3.569 (10 percent). For $K_c(5)$, the critical values are −6.170 (1 percent), −4.479 (5 percent) and −3.779 (10 percent). For ARDL-RECM, the appropriate ARDL(p, q) for $K_c(3)$ are ARDL(1, 0), and ARDL(1, 1); for $K_c(4)$ are ARDL(2, 0), ARDL(1, 2) and ARDL(2, 1). For ARDL-UECM, the appropriate ARDL(p, q) for $K_c(4)$ are ARDL(1, 0), and ARDL (1, 1); for $K_c(5)$ are ARDL(2, 0), ARDL(1, 2), and ARDL(2, 1). The t-values are calculated from the response surface given by Ericsson and MacKinnon (2002). For the F-test for cointegration: for $I(1)$ with $k = 2$, the critical values are 13.410 (1 percent), 7.924 (5 percent) and 5.940 (10 percent); for $I(0)$ with $k = 2$, the critical values are 11.422 (1 percent), 6.561 (5 percent) and 4.898 (10 percent). The F-values are calculated from the response surface given by Turner (2006). **,***Statistically significant at the 5 and 10 percent levels, respectively

Table IV.
Results of the impact of good governance on violent crime

accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption.

We utilized the ARDL model approach to test for cointegration, which is appropriate for a small sample study. Our results suggest that good governance can reduce total crime rates in Malaysia. However, when focussing on each crime, such as violent crime and property crime, we found that the practice of good governance mostly affects property crime rather than violent crime.

We found that while good governance decreases property crime, it cannot fight violent crime. This distinction is important for the government to implement targeted policies, and invest in appropriate tools, to fight crime.

The present study is limited in terms of a limited time period. Future studies could be carried out first, by considering a longer period of time, up to 2013; and second, by examining further the relationship between good governance and other categories of crime rates, such as murder, attempted murder, gang robbery with firearms, gang robbery without firearms, armed robbery, robbery without arms, rape, assault, daylight burglary, night burglary, lorry-van theft, car theft, motorcycle theft, bicycle theft and other theft.

Moreover, criminal activities could be further investigated by state. There are 14 states in Malaysia. This implies that good governance could have a critical effect on different types of crimes, as well as in different locations, or states, and appropriate policies to fight crime can be targeted and implemented accordingly.

Variables	Voice and accountability	Political stability	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
ARDL(p, q)	ARDL(2, 0)	ARDL(2, 0)	ARDL(2, 0)	ARDL(2, 0)	ARDL(1, 0)	ARDL(2, 1)
Constant	4.157 (4.424)**	4.397 (4.575)**	3.797 (3.124)**	4.621 (3.546)**	5.143 (3.226)**	4.573 (3.890)**
pc_{t-1}	0.863 (4.564)**	0.601 (2.767)**	0.860 (3.412)**	0.774 (3.279)**	0.239 (0.995)	0.905 (4.180)**
pc_{t-2}	−0.533 (4.377)**	−0.284 (2.075)	−0.463 (2.754)**	−0.475 (3.356)**		−0.610 (4.141)**
$govern_t$	−0.177 (2.355)**	−0.245 (2.353)**	0.048 (0.142)	−0.406 (1.188)	−0.729 (1.738)	−0.068 (0.348)
$govern_{t-1}$						−0.291 (1.309)
R^2	0.775	0.774	0.620	0.676	0.398	0.768
SER	0.050	0.050	0.065	0.060	0.077	0.054
SBC	16.24	16.23	13.09	14.05	11.58	14.83
AR(1) p-value	0.652	0.901	0.676	0.650	0.097	0.189
Long-run coefficient: θ_1	−0.264 (2.277)**	−0.359 (2.323)**	0.080 (0.143)	−0.579 (1.309)	−0.958 (1.807)	−0.511 (2.160)
H_0: $\lambda = 0$, t-statistic	−0.669 (4.493)**	−0.683 (4.546)**	−0.602 (3.164)	−0.700 (3.604)***	−0.760 (3.162)	−0.704 (3.847)***
H_0: $\beta_1 = 0$, t-statistic	−0.610 (3.964)***	−0.618 (2.627)	−0.607 (3.048)	−0.695 (3.298)	−0.638 (3.764)***	−0.704 (3.847)***
H_0: $\beta_1 = \beta_2 = 0$, F-statistic	7.857***	4.588	4.651	5.751	7.476***	7.854***

Notes: SBC, Schwarz Bayesian Criterion; SER, standard error of regression; AR(1), non-serial correlation of the first-order; For the t-test for cointegration: for $K_c(3)$, the critical values are −5.162 (1 percent), −3.902 (5 percent) and −3.356 (10 percent). For $K_c(4)$, the critical values are −5.633 (1 percent), −4.172 (5 percent) and −3.569 (10 percent). For $K_c(5)$, the critical values are −6.170 (1 percent), −4.479 (5 percent) and −3.779 (10 percent). For ARDL-RECM, the appropriate ARDL(p, q) for $K_c(3)$ are ARDL(1, 0), and ARDL(1, 1); for $K_c(4)$ are ARDL(2, 0), ARDL(1, 2) and ARDL(2, 1). For ARDL-UECM, the appropriate ARDL(p, q) for $K_c(4)$ are ARDL(1, 0), and ARDL (1, 1); for $K_c(5)$ are ARDL(2, 0), ARDL(1, 2), and ARDL(2, 1). The t-values are calculated from the response surface given by Ericsson and MacKinnon (2002). For the F-test for cointegration: for $I(1)$ with $k = 2$, the critical values are 13.410 (1 percent), 7.924 (5 percent) and 5.940 (10 percent); for $I(0)$ with $k = 2$, the critical values are 11.422 (1 percent), 6.561 (5 percent) and 4.898 (10 percent). The F-values are calculated from the response surface given by Turner (2006). **,***Statistically significant at the 5 and 10 percent levels, respectively

Table V.
Results of the impact of good governance on property crime

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